

Appl. No. 10/065,036
Amdt. Dated June 30, 2004
Reply to Office action of April 1, 2004

REMARKS/ARGUMENTS

This amendment is being submitted in response to the Office Action dated April 1, 2004 and concurrent with a Request for Continued Examination (RCE). In the Office Action, claims 1-6, 8-15 and 17-26 were rejected under 35 USC §103 (a) as being unpatentable over Machida (US patent application publication 2002/0115929) in view of Wang et al. (US Patent 5,928,148). In this amendment, claims 1, 9 and 18 were amended and claims 27-39 are newly added. Support for the new claims may be found in page 8, line 5 through page 9, line 10. No new matter has been added. Claims 1-6, 8-15, 17-39 remain pending in this application. Reconsideration in view of the above amendments and following remarks is respectfully requested.

Claims allowable over the applied art

The rejection of Claims 1-6, 8-15 and 17-26 were rejected over Machida (US patent application publication 2002/0115929) in view of Wang et al. (US Patent 5,928,148) is respectfully traversed. The present invention, as claimed in amended independent Claims 1, 9 and 18 are patentable over the Machida reference. The Machida reference does not teach, suggest or disclose each element of the present invention as claimed in amended claims 1, 9 and 18. Specifically, the present invention claims an imaging apparatus for producing a Magnetic Resonance (MR) image of a subject. The apparatus includes at least one radiofrequency (rf) coil array disposed about the subject for transmitting a radiofrequency pulse and adapted for detecting a plurality of magnetic resonance (MR) signals induced from the subject for a given imaging sequence. The apparatus further includes a positioning device for supporting the subject and for translating the subject during imaging and a plurality of receivers for receiving the plurality of MR signals configured to adjust a receiver parameter; wherein the receiver parameter is adjusted based on direction of the image parallel to a motion of the subject. The receiver parameter includes receiver frequency and receiver phase. New claims 27, 28, 32, 33, 36 and 37 discloses a system and method where the receiver frequency is adjusted when a frequency encoding direction of the image is parallel to an axis of a motion of the subject. The receiver phase is adjusted when a phase encoding direction of the image is parallel to an axis of a motion of the subject. In addition claims 29, 34 and 38 teaches a method where the rf coil array is configured to adjust a transmit frequency in response to a translation of the positioning device; and wherein the transmit frequency is adjusted when a slice selection direction of the image is parallel to an axis of a motion of the subject.

The Machida reference does not teach or suggest plurality of receivers for receiving the plurality of MR signals configured to adjust a receiver parameter and further the Machida reference does not teach suggest or disclose adjusting the receiver parameter based on direction of the image parallel to a motion of the subject as described in claims 1, 9 and 18. In addition, the Machida reference does not teach, suggest or disclose adjusting a frequency or phase of the receiver or the transmit frequency of the rf coil. Applicants have thoroughly reviewed paragraph 16 of the Machida reference. The Machida merely discloses a receiver that accepts MR signals (RF signals) and carries out various kinds of signal processing on the MR signals (paragraph 44). The Machida

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reference describes a method an system to generat MR images that involves a continuous movement of an object to be imaged by employing imaging techniques and image-quality improving techniques, such as multi-slice imaging and suppression of artifacts resulted from a movement of an object (paragraph 16). Nowhere, does Machida teach, suggest or disclose the use of a plurality of receivers adapted to adjust a receive parameter based on based on direction of the image parallel to a motion of the subject.

The Wang reference does not overcome the above cited limitations of Machida. Wang discloses a method for acquiring NMR data from a large region of interest by acquiring NMR data from a series of smaller fields of view which collectively span the large region of interest. The patient is automatically translated, or stepped, to a new position within the bore of the magnet by moving the patient table between the acquisition of each field of view. Scan parameters remain constant throughout the procedure and the separate reconstructed images are registered and combined to provide a single image of the large region of interest (column 2, lines 40-50). Nowhere does Wang teach suggest or disclose the use of a plurality of receivers adapted to adjust a receive parameter based on based on direction of the image parallel to a motion of the subject as described in claims 1, 9 and 18.

Thus, no reasonable combination Machida and Wang would obtain Applicants' recited invention of an imaging apparatus comprising a plurality of receivers for receiving the plurality of MR signals configured to adjust a receiver parameter based on direction of the image parallel to a motion of the subject as described in claims 1, 9 and 18.

Further there is no motivation in Machida to combine it with Wang. Machida discloses describes a method an system to generate MR images that involves a continuous movement of an object to be imaged by employing imaging techniques and image-quality improving techniques and Wang discloses a method for acquiring image data from a large region of interest by acquiring the image data from a series of smaller fields of view, which collectively span the large region of interest. Therefore, Machida (either alone or in combination with Wang) does not disclose, teach or suggest disclose applicant's invention as cited in claims 1, 9 and 18.

Obviousness cannot be established absent a teaching or suggestion in the prior art to produce the claimed invention. For a prima facie case of obviousness, the Examiner must set forth the differences in the claim over the applied references, set forth the proposed modification of the references, which would be necessary to arrive at the claimed subject matter, and explain why the proposed modification would be obvious. It is well-established law that the mere fact that references may be combined or modified does not render the resultant modification or combination obvious unless the prior art suggests the desirability of the modification or combination.

Therefore, the present invention, as claimed in amended claims 1, 9 and 18 are patentable over the Machida reference in view of Wang et al.. Claims 2-6 and 27-31, 8-15 and 32-35, 17-26 and 36-39 depend

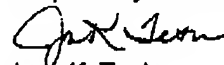
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directly or indirectly from claims 1, 9 and 18 respectively and are allowable by dependency. Withdrawal of the rejections is respectfully requested, and allowance of claims 3 and 13 is respectfully solicited.

In view of the foregoing amendment and for the reasons set out above, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested.

Should the Examiner believe that anything further is needed to place the application in condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number below.

Respectfully submitted,



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